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ENERGY IN SOCIALIST PEOPLES LIBYAN ARAB JAMAHIRIYA(SPLAJ)

BY

ENG. IBRAHIM FELLAH

ENG. TAHER TAHAR

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INTRODUCTION

With an ever increasing demand for energy in its different forms and limited supplies in addition to the several considerations related to its development and use, energy planning is gaining greater and greater importance on national, regional, and international levels. In Africa although the energy demand-supply situation varies from one country to another, but the fact that most of these countries of the continent are emerging developing countries with few years of independence and many different problems facing the aspiration and determination of their people to compensate for the stunted growth in the colonial period and achieve technical, economical, and social progress. This fact is quite convincing to call for meetings such as ours to recognize, discuss and try to solve our problems in energy planning with a cooperation attitude in a friendly atmosphere.

In the Socialist Peoples Libyan Arab Jamahiriya (SPLAJ) we believe in the African unity and the ability of the African peoples to mind their own continent. The Jamahiriya, located in the middle of the northern part of the continent with an area of about 1,750,000 square kilometers and a population of about 3.5 million, has started a great march towards the socio-economical development in the great first of September 1969 revolution, huge gains have been realized.

In the energy sector although oil was discovered in the late fifties, its national development, management and planning has started only few months after the revolution took place. Oil and natural gas are the main primary sources of energy in SPLAJ.

1 - ENERGY CONSUMPTION IN SPLAJ

Total consumption of energy has shown unprecedented progress during the period 1970-1980, considering 1970 as a base year, the rate of yearly growth was 3.4% in 1970 and had increased to 28.4% in the year 1975 and

reached a rate of 11.9% in 1980 It is expected that the rate of energy consumption will increase at a rate of 21% in the year 1985 and will arrive at a yearly rate of growth between 9 to 11% during the period up to the year 2000.

2 - PRESENT AND PROSPECTIVE ENERGY PRODUCTION IN SPLAJ:

In view of the availability of oil and natural gas in SPLAJ in abundance, they are considered as the essential sources for energy production. There are no coal and hydro-potentials in SPLAJ. The trend in near future is to diversify the sources of energy production, a decision for going nuclear have been taken few years ago benefiting the peaceful uses of atomic energy. The plan in this connection is to build a series of NPP's upto the year 2000, the first NPP consisting of two units each with capacity of 440 MW is expected to be constructed in the near future and will be available for commercial operation in early 1990's.

Although the technology of other new and renewable energy resources such as solar, wind and others are not well developed for large-scale industrial applications, research and development in this connection are being carried out in different specialized research centres.

3 - FOSSILE FUEL RESERVES

3.1 Oil

Application of energy produced from oil and gas, as stated previously, oil represents the most dominant source for energy production in SPLAJ, meeting more than 85% of the total energy consumption requirements the rate of oil consumption for energy production have increased from one million barrels per year in 1961 to 23 million barrels in the year 1977, experiencing a rate of yearly growth of 16%. The oil consumption reaches 53.967 million barrels in the year 1980 with a rate of growth 33%. It is expected that the consumption of oil in the year 1985 will reach 101.633 million barrles, having a rate

of growth 21%. The attached drawing shows the ways at which the energy produced from oil is distributed among the different sectors in the year 1980.

Distribution of consumption of energy from oil in
different sectors of economy in 1980

3.2 NATURAL GAS

Since early 1970 natural gas have been used considerably in many industrial activities and for energy production. It has been utilized in methanol production plant (with capacity of 330,000 ton per year) and in ammonia production plant. Besides, it has been used as fuel to operate some electric power plants in Sarir, Kufra and others. Since 1980 the natural gas contributed about 19% of the total energy consumption, it is utilized also in some new projects such as urea and stainless-steel plants.

By the year 1985 the natural gas will account for about 23% of the total energy consumption.

4 - ELECTRICITY

The ways by which electric energy is produced in the already existing power plants in SPLAJ could be either through gas, diesel or steam turbines, however, the most common are the steam turbines.

The consumption of electrical energy has grown rapidly in the last decade, it rose to more than 1000 MW in 1980 as compared to 393 MW in 1975 at a yearly rate of growth 19%.

It is expected that the consumption will be 1850 MW in the year 1985 and will be of the order of 5500 MW in the year 2000. In view of the development plans in SPLAJ, it is expected that industrial sector will absorb 50% and the agriculture sector will absorb about 10% of the total energy consumed in the year 2000.

5 - OTHER ENERGY RESOURCES

After the oil crisis - in 1973 - SPLAJ showed more interest for the proper utilization of oil either for export or development of petro-chemical industries rather than being burnt at the aim of producing electric power. The other promising energy resources are atomic energy, and solar energy.

5.1 NUCLEAR ENERGY

Regarding nuclear energy, it is worth mentioning that SPLAJ has embarked on a nuclear power programme initiating preparation activities in early 1970's. By mid 70 a nuclear research center had been established near Tripoli, which included a research reactor, nuclear, radio-chemical, material laboratories, ...etc., equipped with modern instruments and tools as well as high speed computer facilities. Training programmes for its national manpower have been accomplished successfully in early 1980 in most fields of interest. Since then, teams of qualified scientists and engineers are performing their jobs in the research centre.

The contractual negotiations for construction of the first NPP in SPLAJ are in an advanced stage of finalization. It is expected that the first NPP will be operative in early 1990's.

5.2 - SOLAR ENERGY

Prospects of solar energy utilization have been surveyed throughout the country. Some useful data and information on duration, intensity, and availability of sunshine in different months and seasons of the whole year throughout the country have been collected. A research centre for solar energy has been established near Tripoli for carrying out R&D works. In addition, some research groups have been working in university and college laboratories. A pilot project at Raslanuf has been in operation to establish the feasibility of using solar energy for sea (or brackish) water desalination and electrification and air-conditioning of buildings. In view of the promising potential of solar energy utilization in SPLAJ, we are following seriously the technological developments in solar energy in both advanced and developing countries.

5.3 - OTHER RENEWABLE SOURCES

There is no potential for bio-mass and geothermal as energy source in SPLAJ. Potential exist for wind energy, particularly, in the coastal belt. In the past, wind mills used to draw underground water to the surface, these are no longer used.

However, recording stations are in operation along the coastal belt to register the wind velocities and directions throughout the year. No project on wind energy utilization has been undertaken at the present time.

6 - ENERGY ADMINISTRATION IN SPLAJ

The following Secretariats are involved in matters concerning energy:

1) Secretariat of Petroleum:

This Secretariat is responsible for formulating and implementing plans, programmes and policies for exploration production and marketing of petroleum, natural gas (and petroleum products) in the country.

2) Secretariat of Electricity:

This Secretariat is responsible for planning, policies, construction and management of all production, transmission and distribution facilities for commercial electricity in the country.

3) Secretariat of Atomic Energy:

This secretariat is responsible for all necessary actions and activities for promotion and regulation of the peaceful uses of atomic energy in SPLAJ. In this connection, it is responsible for establishing the relevant laboratories and facilities (including research reactors,....etc.) for research and development. It also has the responsibility for building and operating nuclear power plants in the country.

7 - ENERGY PROSPECTIVE IN AFRICA

The average per capita consumption of energy in African countries is of the order of 400 Kg. coal equivalent, whereas in industrialized countries it is of the order of 5000 Kg. coal equivalent. This indicates that African countries have meager per capita energy consumption and its industrial, economic, and social development are at low levels.

As a result, desirable and adequate progress in different sectors of economy in these countries such as industrialization, agriculture and food production, and other social sectors has not taken place.

If these countries are to achieve advancement in their economy, the per capita consumption should be increased. With this aim in view, these countries should have effective plans and programmes and the necessary qualified manpower and other technical infrastructures.

Energy reserves in Africa may not be abundant, but it has reasonable resources such as oil, coal, uranium reserves as well as hydro-potentials. In addition, it has also prospects for harnessing sources such as solar,

wind, geothermal, bio-mass,....etc. Also it may be pointed out that the natural energy resources are not evenly distributed, and all countries have not made equal progress in technical capabilities, although some of the countries have made excellent progress in these spheres.

It is possible to increase the per capita consumption of energy if the African countries formulate and implement proper plans and programmes of co-operation among them. In this connection the following points of concern for regional co-operation are suggested for consideration:

1 - Establishment of regional energy centre where research and development on problems of economic significance concerning energy could be carried for the benefit of developing countries as a whole and of the countries of the region, in particular. This centre may serve as an institution to provide data and information concerning energy planning in Africa.

2 - Exchange of experts between African countries. In this connection experts from one country may be assigned for technical assistance to another country where expert services or training is required.

3 - Holding of regional conferences, seminars, symposia which may serve as very useful forums for exchange of expertise and information on research, development and planning in country - or region - wise about energy problems.

4 - International Co-operation: In view of technological and industrial infrastructure of the countries of the region, co-operation with international organization such as IAEA, OPEC, OAPEC, and world energy organizations and with both industrialized and developing countries are necessary.